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A taxonomic revision of *Neobuprestis* Kerremans (Coleoptera : Buprestidae) with the description of a new genus and two new species

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Abstract

The genus *Neobuprestis* Kerremans 1903 is redefined and a new genus *Burnsiellus* gen. n. is defined. The putative relationships of *Neobuprestis* and *Burnsiellus* gen. n. are discussed. A key to the species of the two genera are provided. *Balthasarella* Obenberger 1958 is made a subgenus of *Neobuprestis* and its type species *B. melandryoides* Obenberger 1958 is synonymised with *Strigoptera frenchi* Blackburn 1892. *Strigoptera marmorata* Blackburn (1892), *Neobuprestis alboparsa* Carter (1924), *Neobuprestis trisulcata* Carter (1932) are transferred to *Burnsiellus* gen. n. from *Neobuprestis*. Two new species are described: *Neobuprestis (Balthasarella) williamsi* sp. n., *Burnsiellus lobatum* sp.n.

Abbreviations used for collections studied

AMSA	The Australian Museum, Sydney
BMNH	The Natural History Museum, London
GWC	G. Williams Collection, Australia
IRSNB	Royal Belgian Institute of Natural Sciences, Brussels
MPC	M. Powell Collection, Australia
MVMA	Museum of Victoria, Melbourne, Australia
NMWC	National Museum Wales, Cardiff
PMHC	P.M. Hutchinson Collection, Australia
SAMA	The South Australian Museum, Adelaide
TMSHC	T.M.S. Hanlon Collection, Australia
WAMA	The Western Australian Museum, Perth

Data labels

Information on separate labels of type material is shown by a double slash //. Our interpretation of abbreviations on labels and non-label supplementary information is given in square brackets [].

Introduction

Kerremans (1903) when he designated *Neobuprestis* assigned three species to it; *Strigoptera australis*, Blackburn (1892), *Strigoptera frenchi* Blackburn (1892) and *Strigoptera marmorata* Blackburn (1892). Kurosawa (1988) designated *Strigoptera australis* = *Stigmodera (Curis) peroni* Gory & Laporte (1838) as the type species of *Neobuprestis*. The type specimen of *Stigmodera peroni* has not been examined, and the discussion concerning this species is based on the Lectotype of *Strigoptera australis*, designated herein. Examination of the Holotype of *Balthasarella melandryoides* Obenberger (1958) by S. Bílý (pers comm) has confirmed our suspicion that it is conspecific with *S. frenchi*.

Neobuprestis peroni differs from *N. frenchi* in exhibiting marked sexual dimorphism, one aspect of which, the enlargement of the serrate antennal segments in the male is certainly a synapomorphic character within *Neobuprestis*. We therefore retain *Balthasarella* as a subgenus of *Neobuprestis* to reflect this difference.

Two other species have been described in *Neobuprestis*; *N. albosparsa* Carter (1924) and *N. trisulcata* Carter (1932). Carter (1924) suggested that *N. albosparsa* and *N. marmorata* should be generically separated from *N. australis* and *N. frenchi*, but deferred erecting a new genus for these species. Examination of *N. albosparsa*, *N. marmorata*, and *N. trisulcata* has shown that Carter's suggestion was justified and that a new genus is required for these three species. These three species and a new species described herein will be transferred to a new genus *Burnsiellus* gen. n.

Differences between *Neobuprestis* and *Burnsiellus*

The table below lists the main differences between these two genera.

<i>Neobuprestis</i>	<i>Burnsiellus</i>
Antennal cavities forward facing; fully visible when viewed directly from the front (Figs. 15, 16)	Antennal cavities downward facing; not fully visible when viewed directly from the front (fig. 17)
Clypeal margin straight or very shallowly excised at centre; not angulate (Figs. 15, 16)	Clypeal margin moderately deeply excised at centre; obtusely angulate on either side of the excision (Figs. 17)
Distal part of labium pale, less highly chitinised than basal part	Whole of labium highly chitinised
Mandible not strongly angled at base	Mandible strongly angled at base
Pronotum without large depressions	Pronotum with large depressions
Adhesive pads on tarsal segments 1 and 2 more than half the length of the segment	Adhesive pads on tarsal segment 1 and 2 reduced in size, much less than half the length of the segment (Fig. 20)

Sub-generic diagnosis of *Neobuprestis* (s. str.)

Neobuprestis Kerremans 1903

Neobuprestis Kerremans 1903:136

Type species: *Strigoptera australis* Blackburn 1892 (fixed by subsequent designation: Kurosawa 1988).

Diagnosis. Medium sized (length 14–20 mm), elongate subcylindrical species.

Head (Fig. 16): antennal cavities large, approximately circular, forward facing, fully visible when viewed directly from the front, bordered dorsally by a narrow well defined semicircular ridge. Head above eyes (vertex) nearly horizontal, lower part of head between eyes (frons) and clypeal region almost vertical, not separated from one another by a groove or carina; clypeal region with a large depression in the centre just behind the clypeal margin; clypeal margin weakly bisinuate, very shallowly excised at centre, not angulate. Anteclypeus not visible. Genae below eyes relatively broad about one-fifth vertical length of eye. Mandible not strongly angled at base. Distal part of labium pale, less highly chitinised than basal part. Eyes relatively small, vertical length about 2.5 times maximum width, moderately convergent dorsally, moderately convex when viewed from above.

Antennae (Fig. 18): rather long, when flexed backwards reaching just beyond the base of the pronotum; 11 segmented, with segments 3–10 expanded, the expanded part acutely triangular in shape, expanded segments relatively larger in ♂ than ♀; in ♂ expanded segments almost completely covered with basiconic sensillae (see Volkovitsh 2001, Fig. 124); in ♀ fields of B4c sensillae confined to inner margins (see Volkovitsh 2001, Fig. 125); scape almost club shaped, about 2.5–3.0 times length of pedicel; pedicel almost subcylindrical about 1.25 time as long as wide at apex; segment 3 very slightly triangularly expanded, about 1.25 times length of pedicel in ♀, more strongly triangularly expanded and about same length as pedicel in ♂; segment 4 about same length as 3, segments 5–10 slightly progressively shorter in ♀; segment 4 slightly longer than 3, segments 5–10 slightly progressively

narrower in ♂; segment 11 about 2.0 times as long as wide, triangularly expanded, the expansion excised near the apex in ♀, about 3.0 as long as wide and only slightly triangularly expanded, with a subcylindrical prolongation at the apex in ♂.

Pronotum (Figs. 1, 2): about twice as wide as long; anterior and posterior margins weakly bisinuate; lateral margins regularly curved; slightly depressed in mid line near base; lateral carina confined to basal half; punctuation composed of simple shallow punctures, without associated setae. Scutellum: transverse, almost heart shaped, about one tenth width of elytra at base.

Elytra (Figs. 1, 2): slightly widened from base over the humeral callosities; almost parallel sided behind callosities to mid length, before weakly converging to the conjointly rounded apices; lateral margins and apices weakly serrate in ♂, smooth in ♀; epipleura broad opposite the mesepimeron, gradually narrowing opposite metepisternum (metanepisternum), disappearing behind the hind coxa; deflexed ventrally, separated from disc by fine carina; each elytron with four long, well defined, narrow equidistant costae, and a short scutellary costa fusing with the slightly raised suture in the basal fifth; punctuation between costae uniform, without evidence of seriation.

Underside: sparsely punctulate.

Prosternum: anterior margin weakly curved, with a complete narrow bead; prosternal process flat, with a slight groove along the lateral margin, lateral margins almost straight in basal two-thirds, before narrowing in apical third, apex broad. Mesosternal cavity broad, reaching the metasternum.

Legs: tarsal segments 1–4 with well developed pulvilli, occupying apical two-thirds of each segment; Segment 5 elongate, flat club shaped with simple claws, widened at base; metacoxal plate twice as wide at inner edge as at outer edge.

Abdomen: ventrite 1 almost twice as long as ventrite 2, which is about as long as 3 and 4; ventrite 5 almost twice as long as 4, with apex broadly and deeply excised, with a slightly developed flange and well developed lateral spines in ♂ (Fig. 21), apex truncate with a small shallow excision at middle in ♀.

Ovipositor: elongate.

Aedeagus (Fig. 25): with a narrow basal lobe; parameres parallel sided with long sensory setae confined to the apex; median lobe (penis) with the apex produced.

Sub-generic diagnosis of *Neobuprestis* (*Balthasarella*)

Balthasarella Obenberger 1958

Balthasarella Obenberger 1958:487.

Type species: *Baltasarella melandryoides* Obenberger 1958 (fixed by original designation).

Diagnosis. The sub-generic description of *Neobuprestis* (s.str.) above applies to *Neobuprestis* (*Balthasarella*) except for the following differences:

Head (Fig. 15): frons in *N. (B.) williamsi* sp. n. strongly convex in the middle, in *N. (B.) frenchi* more weakly convex.

Antennae: slightly shorter, not reaching the base of the pronotum when flexed backwards; segment 3 not or scarcely expanded; expanded segments of ♂ and ♀ like those of ♀ *Neobuprestis* (s.str.); segment 11 elongate ovate.

Pronotum Figs. (3, 4, 5, 6.): slightly less transverse, with the lateral margins almost parallel sided in basal half; lateral carina reaching or almost the notosternal suture; punctuation with some associated setae on lateral parts.

Scutellum: slightly transverse, about one fifteenth width of elytra at base.

Elytra: apices weakly emarginate, not conjointly rounded; lateral margins very weakly to weakly serrate in apical half in both sexes; each elytron with 3 or 4 long costae, the most lateral one sometimes absent; punctuation next to costae partly seriate.

Abdomen (Fig. 22): ventrite 5 with apex broadly, shallowly excised, without well developed spines or a flange.

Relationships of *Neobuprestis*. In the last thirty years the definition and limits of the subfamilies and tribes of the Buprestidae have undergone numerous changes and many new tribes and subtribes have been erected on the basis of a few characters, whose phylogenetic significance is unclear. Bellamy 2003. Bellamy (2003) attempted to integrate all these changes into a summary of the higher classification of the Buprestoidea. We have used the

subfamily and tribal assignments in the recent World Catalogue (Bellamy 2008, 2009) which largely follows Bellamy, 2003 as the basis for the discussion that follows.

Neobuprestis is currently assigned to the subfamily Buprestinae and to the *Neobuprestis* generic group sensu Volkovitsh (2001). This generic group includes the Australian genus *Balthasarella* Obenberger which is here treated as a subgenus of *Neobuprestis* and *Zulubuprestis* Bellamy from S. Africa (Bellamy 1991). *Neobuprestis* shares many characters with *Zulubuprestis*. The main difference is that *Neobuprestis* does not have an exposed anteclypeus (epistome) as possessed by *Zulubuprestis*.

When the Epistomentini (Levey 1978) was defined there was uncertainty of the relationships of the Epistomentini to other tribes of the Chalcophorinae (now called Chrysocroinae) in which subfamily it was then placed. The first author subsequently realised that the exposed anteclypeus seen in the Epistomentini also occurs in *Buprestis* Linnaeus, *Eurythyrea* Solier, *Yamina* Kerremans, *Cypriacus* Casey, and *Pygicera* Kerremans, *Neobubastes* Blackburn and *Zulubuprestis* currently assigned to the Buprestinae. Volkovitsh (2001) in his study of the antennal structures in Buprestidae associates the Epistomentini with *Neobuprestis*, *Buprestis* and related genera.

The Epistomentini and the other genera mentioned above have an essentially non tropical bihemispheric (amphipolar) distribution. This pattern of distribution is seen in a number of groups of Coleoptera, Crowson (1980), and plant groups, Van Steenis (1972). Crowson (1980) suggests that this type of distribution may be the result of migration during the late Cretaceous from Northern to Southern hemisphere (or vice versa), when equatorial temperatures were lower.

Although *Neobuprestis* shows great similarity to *Zulubuprestis* it lacks an exposed anteclypeus. This suggests either that the exposed anteclypeus exhibits homoplasy in the Buprestinae in which case it cannot be used on its own to infer a close relationship of the Epistomentini, *Zulubuprestis* and *Buprestis* and related genera mentioned above, or if it is in fact a synapomorphy shared by these groups then *Neobuprestis* is not as closely related to these groups as other characters might suggest. Volkovitsh (2001) suggests that *Neobuprestis* and *Balthasarella* (then treated as a separate genus) constitute a separate Australian group from *Buprestis* and related genera, which tends to support the second hypothesis mentioned above. At present we do not think it is possible to draw any firm conclusions regarding the relationship of *Neobuprestis* to the Epistomentini and *Buprestis* and its related genera without a thorough cladistic analysis of the subfamily Buprestinae as a whole.

Key to the species of *Neobuprestis*

- 1 Lateral carina of pronotum confined to basal half; punctuation between elytral costae not arranged in longitudinal series; scutellum 1.5–2.0 times as wide as long; sexually dimorphic: male with expanded segments of antenna relatively larger, expanded segments almost completely covered with basiconic sensillae, lacking obvious sensory foveae (Fig. 18); elytra yellow, sometimes with a slight purple tinge towards the lateral margin (Fig. 1); last ventrite with apex broadly and deeply excised, with a slightly developed flange and well developed lateral spines (Fig. 21); female with serrate segments of antennae relatively smaller, with fields of B4c sensillae confined to the inner margin, with apical sensory foveae; elytra usually purple but sometimes yellow-brown with only a slight purple tinge (Fig. 2); last ventrite with apex truncate sometimes with a small shallow excision at middle; N.W. Victoria, South Australia & W. Australia. *N. (s. str.) peroni* (Gory & Laporte)
- Lateral carina of pronotum almost extending to the notosternal suture (Figs. 5, 6); punctuation between elytral costae partly arranged in longitudinal series next to the costae; scutellum about as wide as long; male and female not sexually dimorphic (no male of *N. frenchi* has been seen); mountains of S.E. Victoria & New South Wales *N. (Balthasarella)* spp. 2
- 2 Hind coxal plate abruptly narrowing about one-third the distance from the inner margin (as in Fig. 31); lateral carina of pronotum slightly curved downwards distally when viewed from the side (Fig. 6) *N. (B.) williamsi* sp. n.
- Hind coxal plate gradually narrowing from the coxal insertion (as in Fig. 30); lateral carina of pronotum straight or slightly curved upwards distally when viewed from the side (Fig. 5) *N. (B.) frenchi* (Blackburn)

***Neobuprestis* (s. str.) *peroni* (Gory & Laporte)**

(Figs. 1, 2, 16, 18, 21, 25)

Stigmodera (*Curis*) *peroni* Gory & Laporte 1838: 48; Pl. 11, fig. 57

Curis *peroni* (Gory & Laporte); Lacordaire 1857: 52; Gemminger & Harold 1869: 1392; Saunders 1871: 57.

Neobuprestis *peroni* (Gory & Laporte) Fairmaire 1877: 327; Gestro 1877: 430; Masters 1886: 78; Kerremans 1892: 132; 1903:

181; Waterhouse 1913: 183; Carter 1928: 277; Obenberger 1930: 363; Kurosawa 1988: 264; Holyński 1993: 28; Bellamy 2002: 84; 2008: 1021.

Strigoptera australis Blackburn 1892: 501.

Neobuprestis australis (Blackburn) Kerremans 1903: 137; Carter 1924, p. 524; 1929: 281; Waterhouse 1913: 184; Obenberger 1930: 363; Kurosawa 1988: 264; figs. 17 & 18; Bellamy 2002: 85; 2003: 127; fig. 260.

Material examined: **Lectotype** ♀ (BMNH) *Strigoptera australis* Blackburn here designated. Type (round red label)// Type// 2528//*Strigoptera australis*, Blackb.//Blackburn Coll. 1910-236//. **LECTOTYPE** *Strigoptera australis* Blackb. B. Levey det. 1991. **Paralectotype** ♀ (SAMA) 2528//Australia Blackb's Coll.// *Strigoptera australis*, Blackb. Co-type//.

In the original description the type locality was given as Yorke's Peninsula, S. Australia.

Other material: **S. Australia:** 3♀ Kangaroo Island, (BMNH, SAMA); 1♂, 2♀ (SAMA) Mindarie; 2♀ (SAMA, NMVA) Murray River. **Victoria:** 2♂, 10♀ (NMVA, SAMA, NMWC) Birchip; 4♂, 6♀ (SAMA, NMVA, NMWC) Mallee district; 1♂, 1♀ (NMVA) Sea Lake; 1♀ (IRSNB) 466 ex coll.A.F. Hoschek; 1♀ (IRSNB) 467 ex coll.A.F. Hoschek. 1♀ (IRSNB) ex coll.Dr. Lotte. **W. Australia:** 1 not sexed (TMSHC) Holt Rock; 1 not sexed (TMSHC) Lake Hurlestone, 6.3.2000, dead; 1♂ (SAMA) Jung. **Australia:** 1 ♂, 1♀ (BMNH) no other data, 1♂, 1♀ (IRSNB) no other data.

Other material not examined: **W. Australia:** 1♀ (PMHC)[image seen] Lort River 40km W of Salmon Gums Dead 2.Feb.2004 P.Hutchinson / Edge Saltlake.

***Neobuprestis (Balthasarella) frenchi* (Blackburn)**

(Figs. 3, 5)

Strigoptera frenchi Blackburn 1892: 500

Neobuprestis frenchi (Blackburn); Kerremans 1903: 137; Carter 1924: 524; 1929: 282; Obenberger 1930: 362; Bellamy 2002: 84; 2008: 1021.

Balthasarella melandryoides Obenberger 1958 (**syn. n.**): 487; Cobos 1974: 104; Bellamy 1985: 419; 1986: 595; 1994: 300; 2002: 82; 2003: 52, fig. 259; 2008: 1022.

Material examined: **Holotype** ♀ (NMVA) *Strigoptera frenchi* Blackburn. Fernshaw/ Type// Type [red label]// *Strigoptera Frenchi*// C. French's Coll 5.11.08// Syntype T-10700 *Strigoptera frenchi* [red label]. The specimen agrees with the original description in which the locality is given as Gippsland.

Other material: **Victoria:** 2♀ no further data; 1♀ Poley Ra[nge], 26.21.46; 1♀ Lake Mtn. Feb. 1942, R.T. Pescott; 1♀ Ben Cairn, Jan 1924, T. Tragellas [name partly illegible], F.E.Wilson coll.; 1♀ no data; all in NMVA; 1♀ S. Gippsland in NMWC. **New South Wales:** 1 unsexed (TMSHC) Sawpit Creek, Kosciusko N.P., 21 Jan. 1998, T.M.S. Hanlon.

***Neobuprestis (Balthasarella) williamsi* sp. n.**

(Figs. 4, 6, 14, 15, 22)

Balthasarella melandryoides Bellamy 1994 nec Obenberger 1958; Bellamy 1994: 300. Bellamy (1994) reported on some specimens of *Balthasarella melandryoides* he had seen from the New England National Park, New South Wales. On distributional grounds we think these are probably specimens of *N. (Balthasarella) williamsi* sp. n.

Material examined: **Holotype** ♂ (AMSA) Summit of Mt. Banda Banda. 1260 m. Mt. Boss s.f. N.W. Wauchope. N.S.W. 15 Jan 1988. G. Williams.// On broad-leaved *Racosperma* sp. [*Acacia* sp.]. Paratypes: 1♂ (GWC) same data as Holotype but G. & B. Williams, D. Bickel; 1♀ (GWC) approx. 60km E.N.E. Gloucester. Barrington Tops State Forest. N.S.W. 6 Jan 1982. G. & T. Williams. Resting on *Cassinia* sp. in snow gum forest.// *Neobuprestis frenchi* Blckb. det G. Williams 1982; 1♀ (SAMA) Barrington Tp [Tops] Jan. '25. S.U. Zoo Exp.

Other material: **New South Wales:** 1 unsexed (TMSHC) Ebor, 14 December 1956, F.T. Fricke.

Other material not examined: **New South Wales:** 1 unsexed (GWC) vic. The Pinnacle, Border Ranges Nat. Park, WNW Nimbin, N.S.W. G. Williams, 28 Dec. 1993.// ex rainforest - sclerophyll forest ecotone; 1♂ (GWC) Summit of Mt. Banda Banda. 1260 m. Mt. Boss s.f. N.W. Wauchope. N.S.W. 15 Jan 1988. G. & B. Williams, D. Bickel.// On broad-leaved *Racosperma* sp. [*Acacia* sp.].

Diagnosis. General diagnosis: length 9.2–16.1 mm (from anterior margin of pronotum to tip of elytra); whole body predominantly bluish green; the elytra along the basal, lateral margins and apices more or less extensively reddish purple; abdominal ventrites and sometimes metaventrite and metacoxae more or less extensively reddish purple; head and pronotum with short very fine, erect, inconspicuous setae; elytra glabrous except for some short very fine, erect, inconspicuous setae close to the apices and lateral margin; underside moderately densely clothed with adpressed, moderately short fine setae.

Head (Fig. 15): densely punctate, the punctures, mostly rather shallow, round; lower half of frons convex, tumescent relative to the upper half of the frons which is flat; fronto-clypeus strongly depressed between the antennal insertions with a large very deep puncture close to the distal margin in the mid-line.

Pronotum (Figs. 6, 14): 1.4–1.6 times as wide at base as long in midline; anterior and posterior margins weakly bisinuate, anterior margin scarcely produced at the centre, with a complete well defined narrow bead; lateral margins almost parallel sided in basal half, weakly convergent to anterior margin; shiny, punctate-reticulate with well marked transverse rugae on disc; midline unpunctured and depressed in basal half; with a well marked depression at the basal margin internal of the elytral humeral callosity; lateral carina visible from above becoming evanescent in apical fifth.

Scutellum: transversely ovate, surface rugulose.

Elytra (Fig. 4): as wide to much wider at base than pronotum at base; basal margin weakly bisinuate; moderately strongly widening over the humeral callosities thence very slightly rectilinearly widening to mid length; before moderately strongly curvilinearly converging to the obliquely subtruncate or slightly excised apices; lateral margins smooth or very weakly serrate in apical third; a well marked large depression internal to the humeral callosity coextensive with the depression at the base of the pronotum; each elytron with a short scutellary costa, and three or four long equidistant costae, which become evanescent near the apex; intercostal areas sparsely to moderately densely, irregularly punctured with pin-prick or very fine weak punctures, which are partly arranged in regular series.

Hypomeron: sparsely punctured with small weak punctures.

Prosternum: punctures near anterior margin and laterally very strongly transversely ellipsoidal; anterior margin with a well defined narrow bead; prosternal process moderately densely punctured with small round punctures; lateral margins straight, slightly convergent towards apex, with a well defined bead at the margin.

Mesoepisternum: sparsely to moderately densely punctured with weak punctures.

Hind coxa (as in Fig. 31): about twice as wide at inner margin as at outer margin, abruptly narrowing about one-third the distance from the inner margin.

Abdomen (Fig. 22): ventrites (sternites) rather uniformly, sparsely punctured with very small weak punctures; apical ventrite strongly produced with the apex broadly, shallowly excised, without a well developed flange or lateral spines.

Aedeagus: not examined.

Ovipositor: elongate.

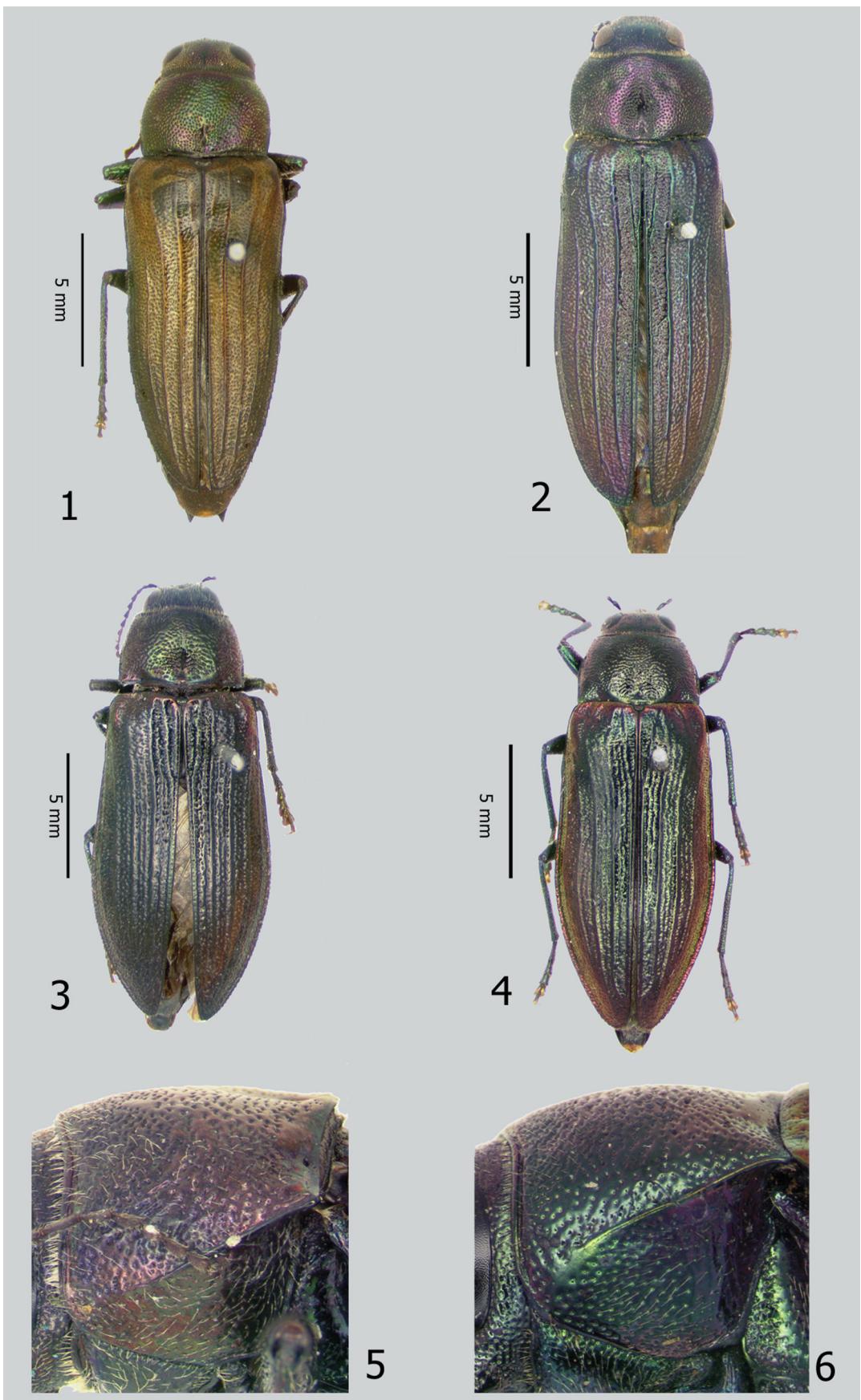
Comments. This species is very similar to *N. (Balthasarella) frenchi* in general appearance. In addition to the distinguishing characteristics given in the key the following differences from *N. (B.) frenchi* were seen in the limited amount of material available. Elytral costae narrower and less well defined especially so in the Holotype. Lower half of vertex variably but at least slightly more convex when viewed from above.

Diagnosis of *Burnsiellus* gen. n.

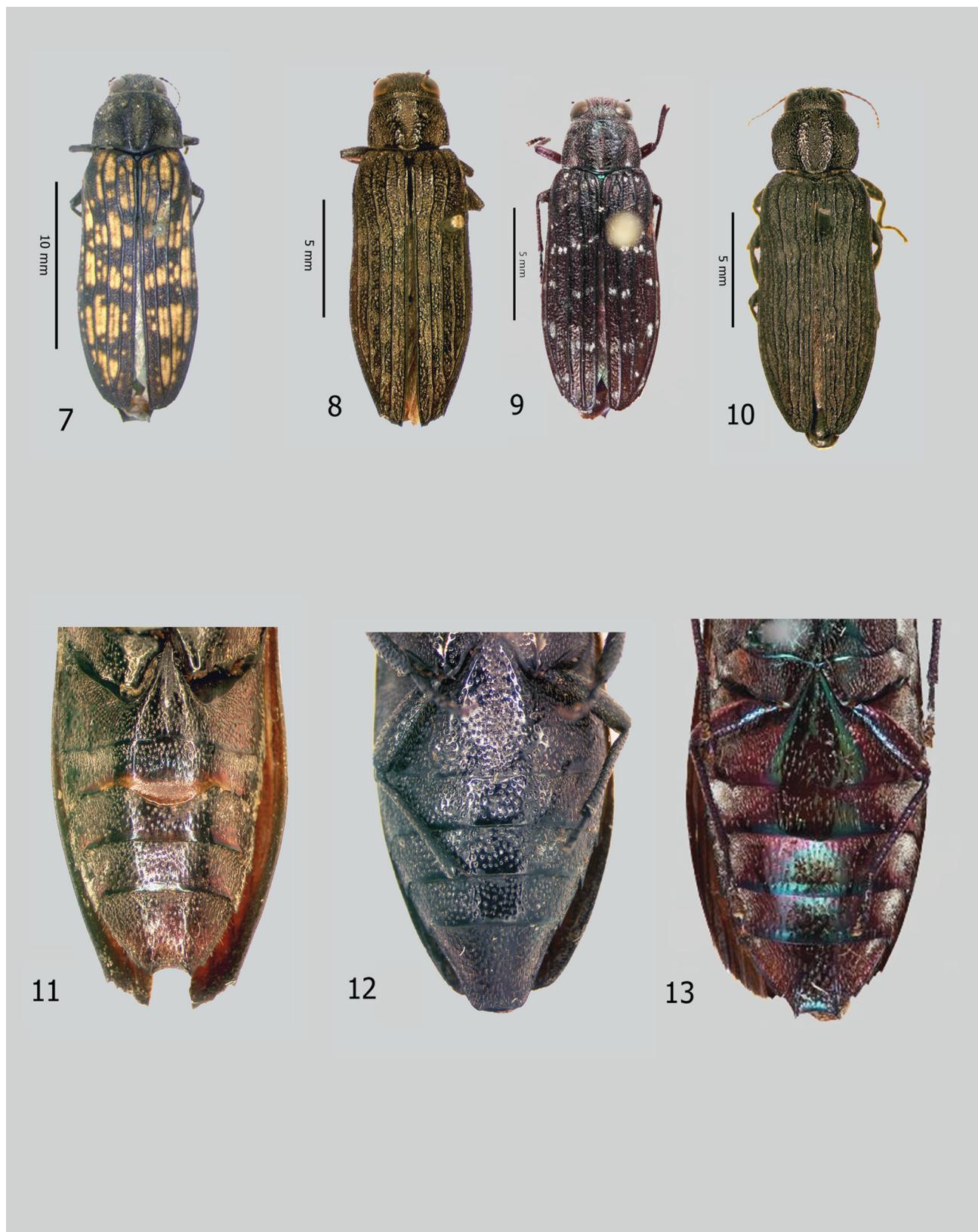
Type species: *Neobuprestis trisulcata* Carter (here designated).

Diagnosis. Medium sized (length 15–20 mm) elongate subcylindrical species flattened above.

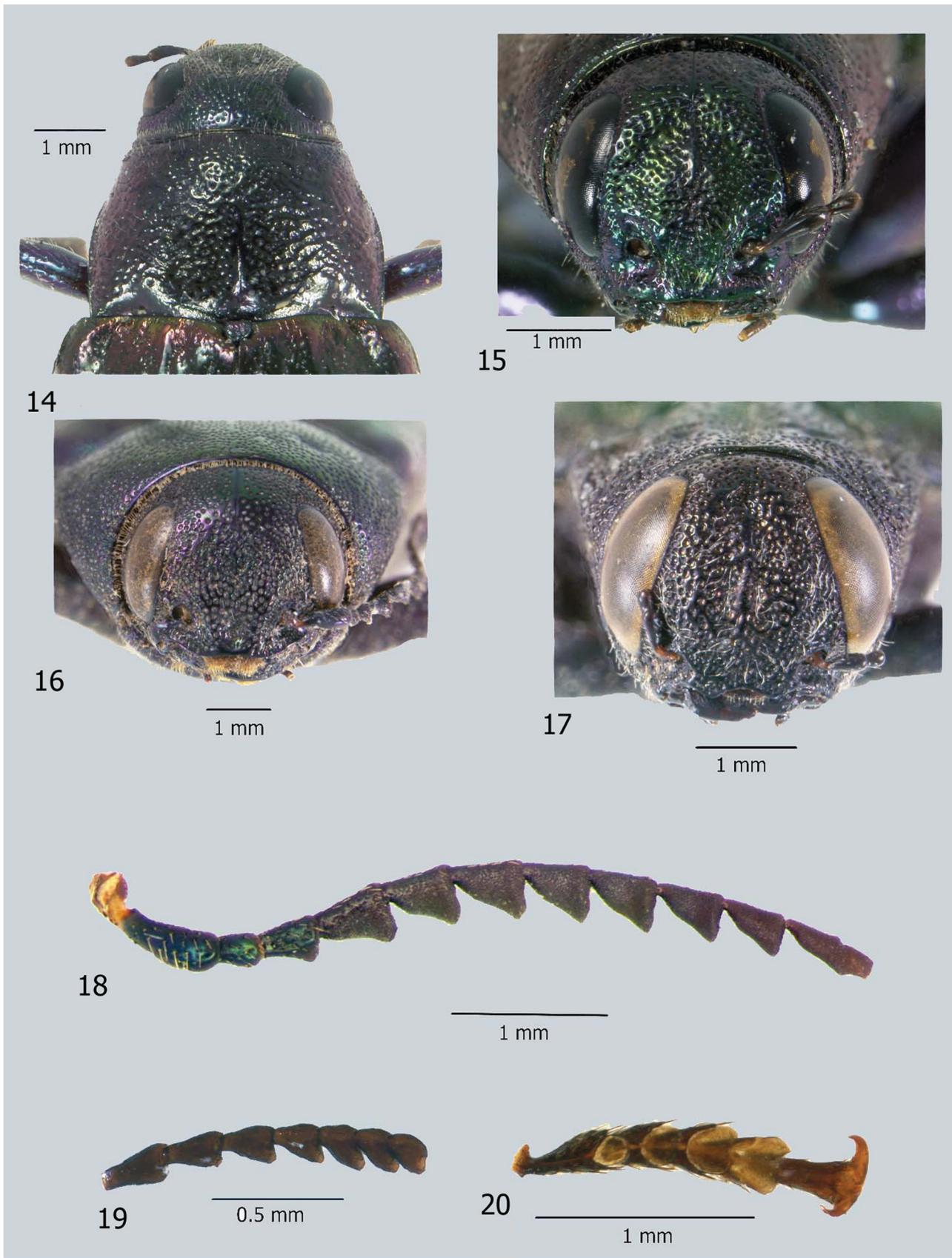
Head (Fig. 17): antennal cavities small, approximately circular, downward facing, not fully visible when viewed directly from the front, bordered by a well defined semicircular ridge dorsally, widely separated. Head above eyes (vertex) dorso-ventrally curved, lower part of head between eyes (frons) and clypeal region almost vertical, not separated from one another by a groove or carina; frons almost flat; clypeal region widely shallowly depressed between the antennal cavities; clypeal margin weakly, broadly emarginate at centre, angulate laterally. Anteclypeus not visible. Genae below eyes relatively broad, about one-fifth vertical length of eye. Mandible strongly angled at base. Labium uniformly highly chitinised. Eyes moderate sized, vertical length about 2.5 times maximum width, moderately convergent dorsally, moderately convex when viewed from above.



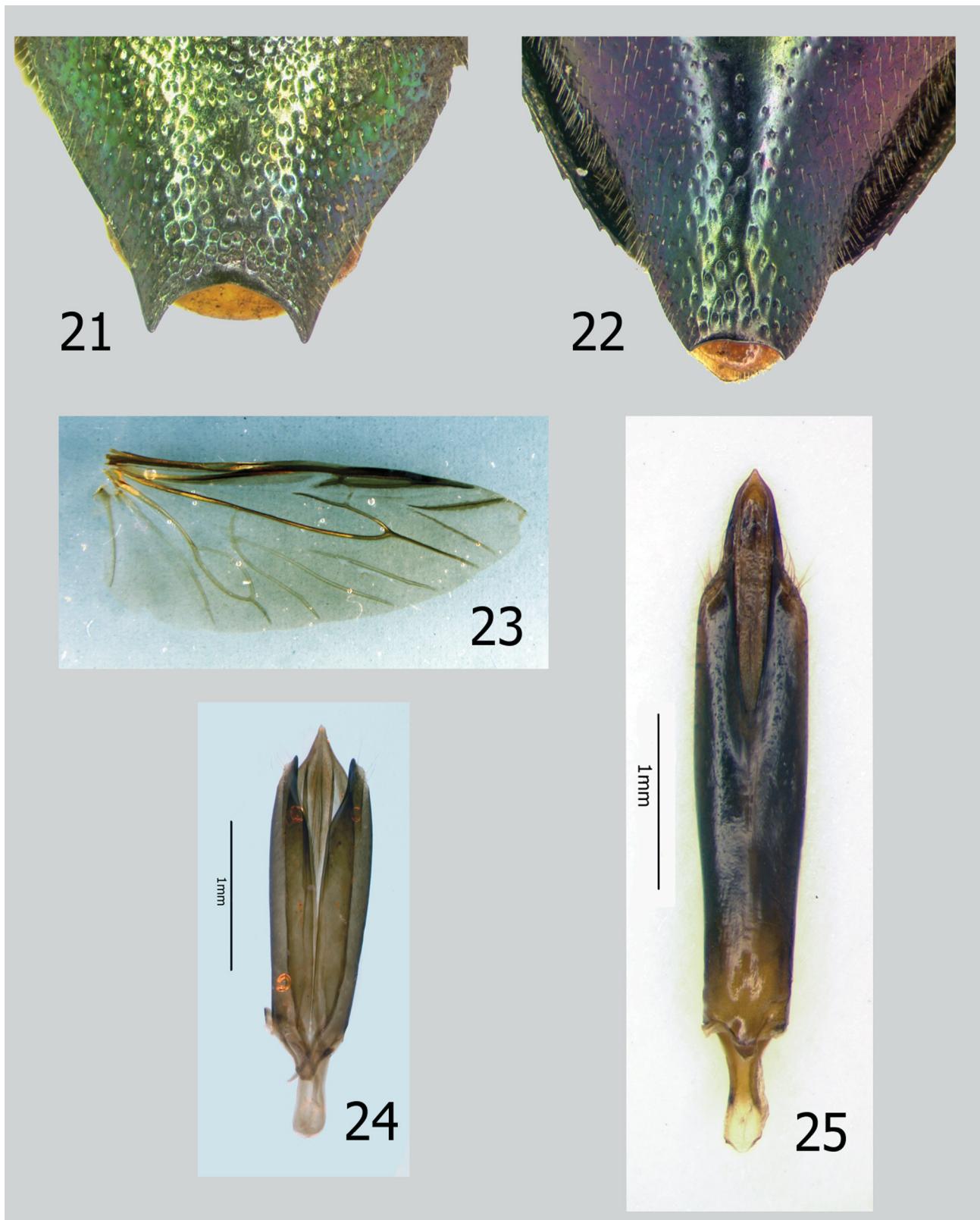
FIGURES 1–6. 1–4. adult habitus: 1. *N. peroni* (Gory & Laporte) ♂ (Birchip, Victoria); 2. *N. peroni* (Gory & Laporte) ♀ (no locality); 3. *N. frenchi* (Blackburn) ♀ (S. Gippsland, Victoria); 4. *N. williamsi* sp. n. ♀ (paratype, 60 km E.N.E. Gloucester). 5–6. pronotum lateral view: 5. *N. frenchi* (Blackburn); 6. *N. williamsi* sp. n.



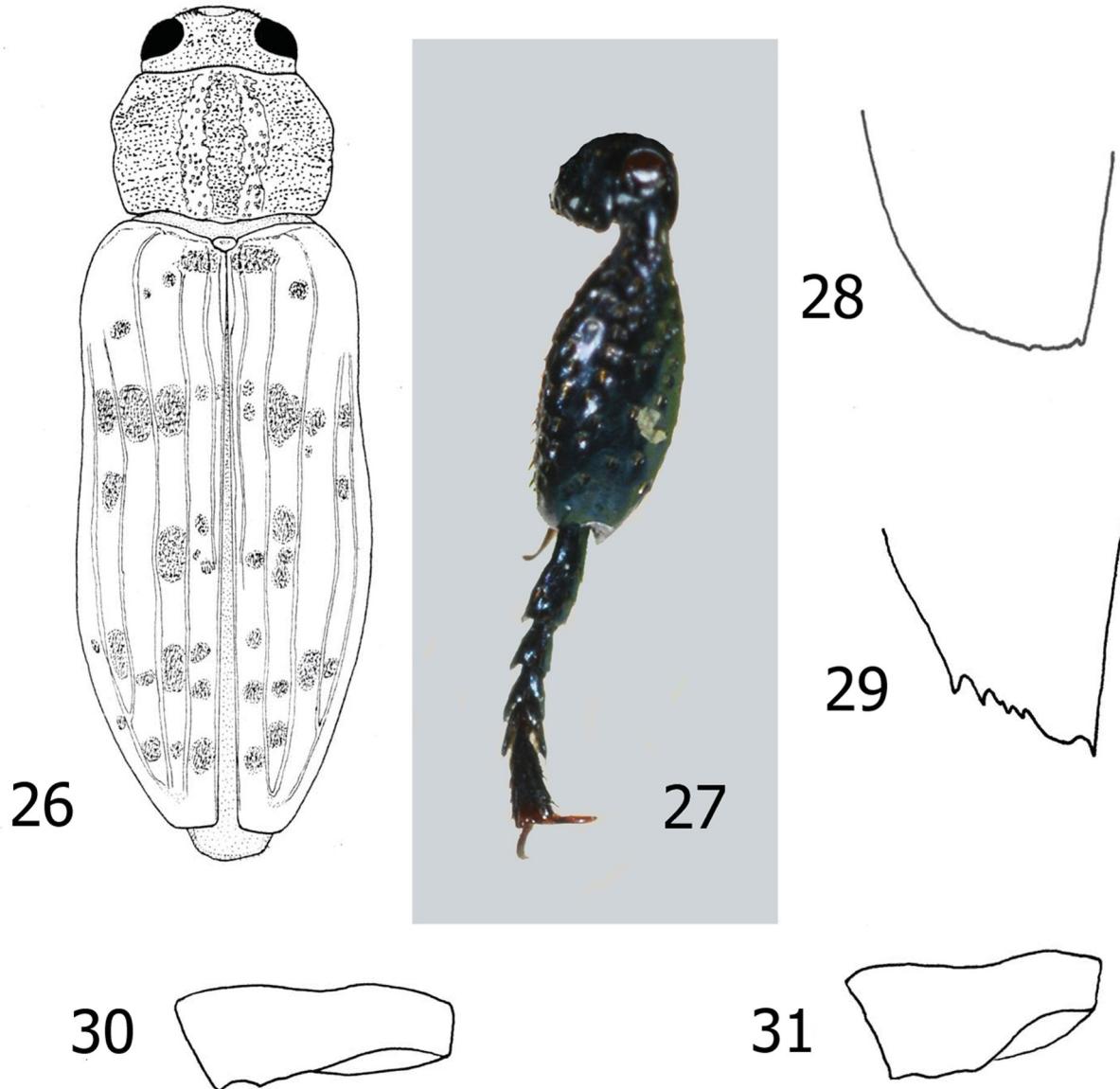
FIGURES 7–13. 7–10.adult habitus: 7. *B. marmorata* (Blackburn) (holotype); 8. *B. lobatum* sp. n. (holotype); 9. *B. albosparsa* (Carter) (holotype); 10. *B. trisulcata* (Carter) (Iron Knob, S. Australia); 11–13. abdomen: 11. *B. lobatum* sp. n. (holotype); 12. *B. trisulcata* (Carter) (Iron Knob, S. Australia); 13. *B. albosparsa* (Carter) (holotype). Figures 9 and 13 are ©The Museum Board of South Australia 2013.



FIGURES 14–20. 14. head & pronotum *N. williamsi* sp. n. (paratype, Barrington Tops, New South Wales); 15–17 head: 15. *N. williamsi* sp. n. (paratype, Barrington Tops, New South Wales); 16. *N. peroni* (Gory & Laporte) ♀ (no locality); 17. *B. lobatum* sp. n. (holotype); 18. antenna ♂ *N. peroni* (Gory & Laporte) (Birchip, Victoria); 19. apical 7 antennomeres of *B. lobatum* sp. n. (holotype); 20. tarsal segments of *B. lobatum* sp. n. (holotype).



FIGURES 21–25. 21–22. apical abdominal ventrite: 21. *N. peroni* (Gory & Laporte) ♂ (Birchip, Victoria); 22. *N. williamsi* sp. n. ♀ (paratype, 60 km E.N.E. Gloucester); 23. wing of *B. lobatum* sp. n. (holotype); 24. aedeagus of *B. lobatum* sp. n. (holotype); 25. aedeagus of *N. peroni* (Gory & Laporte) ♂ (Birchip, Victoria).



FIGURES 26–31. 26. habitus drawing of *B. trisulcata* (Carter); 27. mid tibia of male *B. trisulcata* (Carter); 28–29 left elytral apex: 28. *B. trisulcata* (Carter); 29. *B. lobatum* sp. n.; 30–31. right metacoxal plate: 30. *B. marmorata* (Blackburn); 31. *B. lobatum* sp. n.

Antennae (Fig. 19): rather short, when flexed backwards, not reaching the base of the pronotum; 11 segmented with segments 4–10 expanded, sensory pores concentrated in a distal fovea on the inner side of each expanded antennomere.

Pronotum (Figs. 7, 8, 9, 10): wider than long, approximately rectangular, with a broad medial longitudinal depression and a variably developed depression internal of the hind angles in the basal third; lateral carina incomplete, confined to the basal three-quarters.

Scutellum: small, ovoid.

Elytra (Figs. 7, 8, 9, 10, 26, 28, 29): wider than pronotum; sides bisinuate, the lateral margins without serrations; apices separately subtruncate to obliquely truncate with an irregular margin; disc with four equidistant longitudinal costae, a shorter scutellary costa and a costate sutural margin; punctuation between costae without evidence of seriation, but with irregular patches of smaller denser finer punctuation, bearing short setae; epipleura moderately broad opposite the mesepimeron, slightly narrowing opposite metepisternum (metanepisternum) before becoming evanescent opposite the hind coxae; deflexed ventrally, separated from disc by fine carina.

Underside: punctate to punctate reticulate.

Prosternum: anterior margin weakly curved, with a complete bead; posternal process flat, without a groove along the lateral margin, lateral margins curved in basal half, before narrowing in apical half, apex broad. Mesosternal cavity broad, reaching the metasternum.

Legs (Figs. 20, 27): tarsal segments 1 and 2 with reduced pulvilli, occupying less than half segment length, those of 3 and 4 less reduced occupying half or more segment length; segment 5 flat club shaped with simple claws, widened at base; metacoxal plate 1½ to 2 times as wide at inner edge as at outer edge. Mid tibia in male strongly swollen in *B. trisulcata* (Fig. 27), but not in males of the other three species.

Abdomen (Figs. 11, 12, 13): ventrite 1 almost twice as long as 2, which is about as long as 3 and 4; 5 almost twice as long as 4, with apex broadly and shallowly excised, with a flange and well developed lateral spines in ♂ (Fig. 11, 13), apex truncate or broadly and shallowly excised in ♀ (Fig. 12).

Ovipositor: elongate.

Aedeagus (Fig. 24): with a narrow basal lobe; lateral margins of parameres subparallel with long sensory setae confined to the apex; median lobe (penis) with the apex produced.

Wing: (Fig. 23): terminology follows that of Lawrence et al. (2010) with terminology of Good (1925) in brackets. Radial cell narrow, elongate; cross-vein r4 (radiomedial crossvein) slightly distal of base of radial cell; veins MP₃ (1stA), MP₄ (2dA₁) and CuA₂ (2dA₂) fused basally (*B. trisulcata*) or MP₃ (1stA) not fused to MP₄ (2dA₁) and CuA₂ (2dA₂) (*B. lobatum* sp. n.), attached to vein MP₁₊₂ (cubitus); wedge cell (2d-2dA) present, closed.

Etymology. The masculine generic name is dedicated to the late Gordon Burns in recognition of his contributions to Australian coleopterology and particularly buprestology. Gordon will be remembered as an enthusiastic collector and student of entomology, for his well prepared and curated collection and for the many hours of work in the collections of the Museum of Victoria.

Relationships of *Burnsiellus* gen. n.

Burnsiellus has three unusual, probably apomorphic characters which are very rare in the Buprestinae. Tarsal segments 1 and 2 have very reduced pulvilli (Fig. 20); the pronotum is strongly, broadly depressed at the centre (Figs. 7, 8, 9, 10), and the apical part of the mandible is sharply angled with the basal part. The latter character is also seen in the Nearctic and Neotropical genera *Ditriaena* Waterhouse, *Spectralia* Casey and the monotypic Jamaican genus *Aglaostola* Thomson, and probably also in the monotypic Panamanian genus *Panapulla* Nelson to judge from the figure of its head (Nelson, 2000). Some species of *Spectralia* e.g. *S. arcuata* (Laporte & Gory) also have the former two characters as well. Volkovitsh (2001) places *Ditriaena*, *Spectralia* and *Aglaostola* in the *Aglaostola* branch of the subfamily Buprestinae, where *Panapulla* is also currently placed (Bellamy, 2008). Amongst the genera under consideration it shares with *Spectralia*, *Aglaostola*, and *Ditriaena* an excised posterior margin to the apical ventrite with a well developed flange in the excision. We consider this to be a relatively apomorphic characteristic in the Buprestinae, the more plesiomorphic condition being a rounded posterior margin lacking a flange or spines. The occurrence of a suite of shared probably apomorphic characters in *Burnsiellus* and the Neotropical genera mentioned above would suggest a relatively close phylogenetic relationship.

The four species assigned to *Burnsiellus* show considerable differences from one another which might suggest that they are not very closely related, and could be assigned to different genera or subgenera, however the most important difference are the swollen mid tibia in male *B. trisulcata* and the large semitransparent lobe of the posterior margin of the second visible ventrite in *B. lobatum* sp. n., which may also be a secondary sexual character. We therefore refrain from erecting more monotypic genera or subgenera based solely on secondary sexual characters.

Bionomy. Little is known about the biology of *Burnsiellus*. Paul Hutchinson has found *B. trisulcata* emerging from a large *Acacia* sp. (probably *A. aneura*) at L. Monger causeway, W. Australia. The emergence holes were mostly within four feet of the ground in a trunk more than 1 foot in diameter. Mike Powell had one male and one female *B. marmorata* emerge from a billet of *Melaleuca lanceolata* collected at Hopetoun, WA. The billet was cut from living tree on 17/12/2010, and the specimens emerged on 29/12/2011 and in mid January 2012 (M. Powell pers comm.). At the same locality Paul Hutchinson has found dead and live individuals of this species beneath 20+ foot high *Melaleuca lanceolata* with suitable sized emergence holes in the trunks and branches. Two of the four known species are widely distributed, however specimens are rarely collected which might suggest that their adult

behaviour may not be that of typical adult Buprestidae. The essentially cryptic colouration of *B. trisulcata* (Carter), *B. albosparsa* (Carter) and *B. lobatum* sp. n. and the capture of one specimen of *B. trisulcata* at light might suggest that adults are crepuscular or nocturnal, however Mike Powell collected a very active male specimen of *B. trisulcata* in shade at 11 am at 32 km N of Gascoyne Junction, W.A. on 2 Nov 1999.

Key to the species of *Burnsiellus*

- | | | |
|---|---|---------------------------------|
| 1 | Metacoxal plate strongly widening to the femoral insertion, about twice as wide at the medial edge as at the lateral edge (Fig. 31)..... | 3 |
| - | Metacoxal plate less strongly widening to the femoral insertion, about one and a half times as wide at the medial edge as at the lateral edge (Fig. 30)..... | 2 |
| 2 | Elytra purple-brown with black costae and small pulverulent white spots (Fig. 9); underside entirely 'metallic' reddish purple and blue-green; Queensland | <i>B. albosparsa</i> (Carter) |
| - | Elytra straw coloured with brown patches and black costae (Fig. 7); underside largely 'metallic' purple-brown but anterior margin and lateral margin of prosternum yellow; W. Australia, S. Australia, Victoria | <i>B. marmorata</i> (Blackburn) |
| 3 | Elytral apices subtruncate, without well defined teeth (Fig. 28); elytra very densely almost contiguously punctured between the costae; pronotum strongly narrowing to the anterior and posterior angles (Figs. 10, 26); fronto-clypeus strongly depressed between the antennal insertions; mid tibia much broader than hind tibia, strongly swollen in male, with long tibial spurs which curve at the apex; posterior margin of 2nd visible ventrite simple (Fig. 12); apex of last visible ventrite truncate, without lateral teeth (Fig. 12), W. Australia, S. Australia, New South Wales | <i>B. trisulcata</i> (Carter) |
| - | Elytral apices obliquely truncate, with well defined teeth (Figs. 8, 29); elytra less densely punctured between costae; pronotum almost parallel sided (Fig. 8); fronto-clypeus only slightly depressed between the antennal insertions; mid tibia about as broad as hind tibia, not swollen in male, with shorter, straight tibial spurs; posterior margin of 2nd visible ventrite with a large semi-transparent lobe at the middle, covering part of the 3rd ventrite (Fig. 11); apex of last visible ventrite slightly concave, with lateral teeth (Fig. 11); Victoria | <i>B. lobatum</i> sp. n. |

Burnsiellus albosparsa (Carter)

(Figs.9, 13)

Neobuprestis albosparsa Carter 1924: 523; 1929: 281; Obenberger 1930: 362; Bellamy 2002: 84; 2008: 1021.

Material examined: Holotype ♂ (not dissected) (SAMA) Cairns, Allen// TYPE H.J.C. *Neobuprestis albosparsa* Carter.

Burnsiellus marmorata (Blackburn)

(Figs. 7, 30)

Strigoptera marmorata Blackburn 1892, p. 501.

Neobuprestis marmorata (Blackburn), Kerremans 1903:137; Carter 1924: 524; 1929: 282; Obenberger 1930: 362; Bellamy 2002: 84; 2008: 1021.

Material examined: Holotype (BMNH) Type// 84// Type// *Strigoptera marmorata* Blackb. Blackburn Coll. 1910-236// HOLOTYPE *strigoptera marmorata* Blackb.B. Levey det. 1991. [The type locality was given as S. Australia by Blackburn].

Other material: **S. Australia:** 4♀ (SAMA) Murray River. **Victoria:** 1 not sexed (NMVA) Glenelg River, near Nelson, 1.34; 1 not sexed (NMVA) Queenscliffe, H.W. Davey; 1 not sexed (NMVA) Victoria. **W. Australia:** 7 not sexed (TMSHC) Lake Hurlestone, 6 March 2000, H. DeMarz, dead in strandline; 2 not sexed (WAMA) found dead, edge of Lake Hurlestone, 31 October 2000–April 2001; 1 not sexed (WAMA) Hopetoun Caravan Park, 19 February 2008, dead under *Melaleuca*.

Other material not examined [images seen]: **W. Australia:** 3♂, 2♀ (PMHC) Hopetoun West.Aust. 22.Feb.2006 P.Hutchinson / *Neobuprestis marmorata* under *Melaleuca*; 1♂, 1♀ (PMHC) Hopetoun Caravan park West.Aust. 19.Feb.2008 P.Hutchinson / *Neobuprestis marmorata* dead under *Melaleuca*; 1♀ (PMHC) Lort River 40km W. of Salmon Gums Dead 3.Feb.2004 P.Hutchinson / *Neobuprestis marmorata* edge saltlake; 1♀ (PMHC) Lake King West.Aust. dead 24.Oct.2004 P Hutchinson / *Neobuprestis marmorata* Edge Saltlake; 1♀ (PMHC)

L.Seabrook West.Aust. Dead 29.Jan.2004 P. Hutchinson / *Neobuprestis marmorata* Edge Saltlake; 1♀ (PMHC)
L.Hurlestone 6.3.00 Dead // L.Hurlestone N. of L.King West. Aust. 6.Mar.2000 H.DeMarz / *Neobuprestis marmorata* Dead on Saltlake.

***Burnsiellus trisulcata* (Carter)**

(Figs. 10, 12, 26, 28)

Neobuprestis trisulcata Carter 1932: 102, Fig. 1; Bellamy 2002: 85; 2008: 1022.

Material examined: Holotype ♀ (AMSA): Bogan R.[River] N. S. Wales, J. Armstrong// Holotype// K67306// *Neobuprestis trisulcata* Cart. Id. by H. J. Carter. HOLOTYPE. Other material: **N. S. Wales:** 1 not sexed (NMVA) Bogan R., J. Armstrong, ex. F. E. Wilson Collection. **S. Australia:** 1♀ (SAMA) Iron Knob, at light, 1959, P. Aitken **W. Australia:** 1♀ (TMSHC) Paynes Find Rd., Nyngan turnoff, 6.1.1997, in red bucket trap, H. DeMarz.

Other material not examined [images seen]: W. Australia: 1♂ (MPC) 32 km N of Gascoyne Junction, W.A., 2 Nov 1999; 1♂ (MPC) 44km E of Perenjori, 2 January 2000, dead on the strandline of salt lake; 3♂(PMHC) L.Mongers causeway West.Aust. 2.Dec.2002 - 2.Feb.2003 P.Hutchinson / *Neobuprestis trisulcata* on Acacia aneura; 1♀ (PMHC) 1.5km E of L.Monger C/way West.Aust. 8.Jan.2002 (Dead) P.Hutchinson / *Neobuprestis trisulcata*; 1♂ (PMHC) L.Monger causeway West.Aust. 1.Dec.2003 - 26.Jan.2004 P.Hutchinson / *Neobuprestis trisulcata* sticky trap *Acacia aneura*;

***Burnsiellus lobatum* sp. n.**

(Figs. 8, 11, 17, 19, 20, 29, 31)

Material examined: Holotype ♂ (BMNH) Austr. Melbn.[Melbourne] 53 55// HOLOTYPE *Burnsiellus lobatum* sp. n. B. Levey det. 1992. [The specimen came to the BMNH in 1853 amongst some material from Mr Baly. This was probably J. Baly who described many Australian Chrysomelidae in the Transactions of the Entomological Society in 1855, and presumably acquired the specimen from one of his contacts in Australia].

Diagnosis. General diagnosis: length 14.1 mm (from anterior margin of pronotum to apex of elytra); head, pronotum and elytra predominantly blue-black, the more densely punctured setose areas of elytra coppery and emerald green; underside predominantly blue-black, abdomen with reddish violet reflections; the lobate central part of the distal margin of the second abdominal ventrite brownish yellow, transparent, lightly chitinised; head, pronotum and underside sparsely clothed with moderately long adpressed silvery setae; elytra appearing glabrous but the more densely punctured areas moderately densely clothed with very short inconspicuous adpressed setae.

Head (Fig. 17): very densely punctate reticulate, the punctures moderately deep round to ovate; frons with a well defined central carina; unpunctured areas shiny; lower two-thirds sparsely clothed with moderately long, curved silvery setae; distal margin of fronto-clypeus with a broad shallow V shaped excision bordered by obtusely angulate peaks, area just basal to the distal margin broadly, shallowly depressed; vertex about one-third width of head across eyes when viewed from above; eyes moderately convex, inner margins strongly convergent dorsally, the margins regularly curved.

Antennae (Fig. 19): short, when extended backwards not reaching beyond mid-length of pronotum; antennomere 1 strongly bent at basal third, the basal third brownish yellow, distal two-thirds blackish green about 2½ times length of 2; 3 & 4 missing, 5 & 6 longer than wide, subserrate; 7–8 progressively shorter triangularly serrate, 9–11 wider than long, subserrate.

Pronotum (Fig. 8): 1.48 times as wide at base as long in midline; anterior margin very weakly bisinuate, with a very poorly developed median lobe, without a groove or bead along the margin; posterior margin weakly curved on either side of a broad well developed median lobe; lateral margins subparallel, weakly convergent to anterior and posterior angles; posterior angles slightly obtuse; disc with a broad longitudinal, densely punctured depression, bordered on either side by a broad longitudinal, sparsely punctured callosity; lateral half densely punctured with a well marked, more sparsely punctured callosity anterior to the basal angle; punctures moderately deep, round, with associated moderately long, adpressed silvery setae; lateral carina not visible from above, slightly curved, extending just over half distance from basal angle towards anterior margin.

Scutellum: small, convex, approximately shield shaped, about one-twentieth width of elytra at base.

Elytra (Figs. 8, 29): much wider than pronotum; basal margin biarcuate; strongly widening over the humeral callosities, thence parallel sided for a short distance, before sinuately widening to mid-length, then narrowing to the very broad obliquely truncate, irregularly, minutely serrate apices; sutural margins costate for entire length; each elytron with a short scutellary costa which fuses with the sutural costa at the basal quarter, and four long equidistant costae which anastomose near the apex; costae unpunctured, the area between the costae irregularly, densely rugose-punctate, glabrous; with areas of much smaller punctures bearing very short adpressed setae.

Hypomeron: very densely to contiguously rugose-punctate, with sparse moderately long adpressed silvery setae.

Prosternum: densely punctate at centre, very densely transversely rugose-punctate laterally, with dense moderately long adpressed silvery setae laterally; anterior margin with a poorly defined broad flat bead; prosternal process densely punctured, trilobate, with lateral margins curved and apical lobe broad at tip.

Mesoepisternum: very densely punctured with large shallow setae-bearing punctures.

Mesosternum, mesoepimeron and metasternum contiguously punctate-reticulate with sparse moderately long adpressed silvery setae.

Abdomen (Fig. 11): ventrites moderately densely punctured with shallow punctures at centre, densely to very densely punctured laterally, moderately densely clothed with moderately long adpressed silvery setae; distal margin of second ventrite broadly produced in a semi-transparent lightly chitinised brownish yellow curved lobe at centre, which broadly overlaps the third ventrite; apical ventrite broadly, shallowly excised with a well developed flange in the excision, bordered laterally by well developed spines.

Aedeagus (Fig. 24): lateral margins of parameres subparallel; median lobe acutely produced at apex.

Comments. The unusual development of the distal margin of the second abdominal ventrite might justify placement of this species in a separate subgenus or even a separate genus. We have refrained from this action since the female is unknown and this character might be merely an unusual secondary sexual character of the male, although similar lobes on the 2nd (sometimes also on 3rd and 4th ventrites occurs in some species of *Polycesta* Dejean 1833, *Paratyndaris* Fisher 1919 and *Sponsor* Gory & Laporte 1839, where they are not confined to one sex (M.Volkovitsh pers. comm.).

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